

Asthma Mortality in Rhode Island and the United States, 1979-1998

Leanne C. Chiaverini and
Jay S. Buechner, PhD

Several recent studies have indicated an increase in United States (US) asthma mortality rates over the past two decades,^{1,2} and accordingly, the national *Healthy People 2010* objectives for asthma mortality are aggressive.³ (Table 1) In contrast, Rhode Island (RI) rates have been level over the period,⁴ and in 1994-1998, RI was either below or very near each of the nation's five age-specific objectives for asthma mortality.³ (Table 1) This report analyzes the differential between RI and US asthma mortality rates, independently and in relation to mortality from all respiratory diseases.

Methods. Using the Centers for Disease Control and Prevention (CDC) WONDER System's Compressed Mortality Files,⁵ RI and US age-adjusted mortality rates for asthma as the underlying cause of death (ICD-9 code 493) were obtained for the years 1979 through 1998. Average annual rates for the white population were produced for the five-year periods 1979-1983, 1984-1988, 1989-1993, and 1994-1998. All rates were age-adjusted to the 2000 standard US population and reflect average annual number of deaths per million population. Rates for males, females, and both genders combined were examined.

RI and US age-adjusted mortality rates from 1979 to 1998 for total respiratory diseases (ICD-9 code 460-519), emphysema (ICD-9 code 492), and chronic bronchitis (ICD-9 code 491) were extracted using the same methods as described for asthma mortality rates. [Note: Mortality rates for emphysema and chronic bronchitis were examined only to investigate whether erroneous classification of asthma deaths to other respiratory illnesses could be responsible for the decrease in RI age-adjusted asthma mortality rates. In both cases, RI and US rates were parallel over time, suggesting that the increasing differential between RI and US asthma mortality was not an artifact of classification.]

Because of the small number of asthma deaths among races other than white in RI, mortality rates for these groups were statistically unreliable and have not been included in the analysis.

Results. From 1979 to 1998, 245 RI residents died as a result of asthma. The majority of deaths were among whites (221), among

women (154), and among persons ages 65 and over (145). The distribution of asthma deaths among sub-populations changed little over time.⁵

Comparison between age-adjusted asthma mortality rates of whites in RI and the US from 1979 to 1998 showed that RI rates were consistently lower than those for the US. (Figure 1) RI rates decreased by 12% from 1979-83 to 1994-98. US rates increased by 38% from 1979-83 to 1989-93 and changed little in 1994-98. In 1979-83, the US rate was 12% higher than the RI rate; by 1994-98 the US rate was 76% higher.

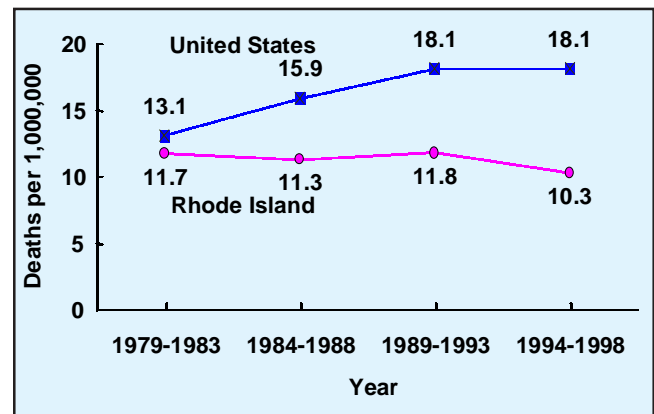


Figure 1. Age-adjusted asthma mortality rates per 1,000,000 whites, Rhode Island and United States, 1979-1998.

Among white males, asthma mortality in both RI and the US peaked during 1989-93 and fell in 1994-98. (Figure 2) However, from 1979-83 to 1994-98, RI rates had an overall decrease of 20%, while US rates increased by 17%. Rates for white females were generally higher than rates for white males. Among white females in RI, the rate changed little over the period of observation, while the US rate increased by 53% from 1979-83 to 1994-98.

In RI, asthma accounts for approximately 2% of all respiratory disease mortality. The RI rate for total respiratory disease mortality among whites increased 28% from 1979-83 to 1994-98. (Figure 3) By sex, rates for white females increased greatly (58%) from 1979-83 to 1994-98. Rates for white males in RI decreased from 1984-88 to 1994-98, but overall increased by 7%. Over the entire period of observation, US rates were consistently higher than RI rates. In 1979-83, the RI rate was 16% below the US rate; by 1994-98 the RI rate was 18% lower than the US rate.

Discussion. From 1979 through 1998, both asthma and total respiratory disease mortality rates for RI were below those of the United States. While the trends in total respiratory disease mortality for RI and US were similar, a diverging trend was seen for asthma mortality. In general, RI rates for asthma mortality were flat or decreasing while US rates were climbing.

Among the possible causes of the observed trend in RI asthma mortality rates are: (1) A decrease in asthma morbidity is

Table 1. *Healthy People 2010 Objective 24-1. Reduce asthma deaths*

Objective	Age Group	U.S. 1998 baseline	U.S. 2010 Target	Rhode Island 1994-1998
Rate per Million				
24-1a.	Children under age 5 years	2.1	1.0	0.0
24-1b.	Children aged 5 to 14 years	3.3	1.0	0.0
24-1c.	Adolescents and adults aged 15 to 34 years	5.0	2.0	2.1
24-1d.	Adults aged 35 to 64 years	17.8	9.0	10.8
24-1e.	Adults aged 65 years and over	86.3	60.0	46.4

Sources: *Healthy People 2010: Objectives for Improving Health*; CDC WONDER's Compressed Mortality Files

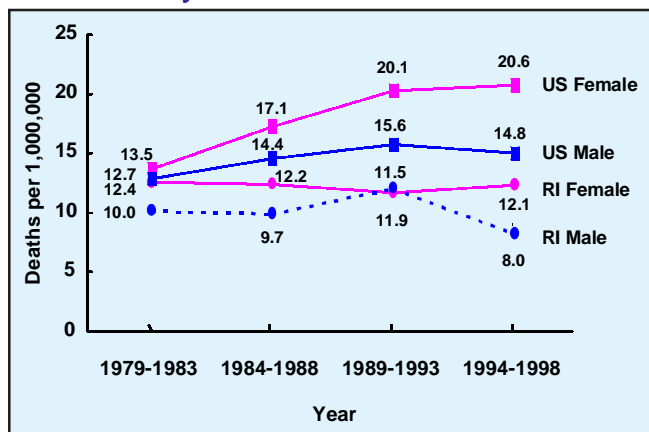


Figure 2. Age-adjusted asthma mortality rates per 1,000,000 whites, by sex, Rhode Island and United States, 1979-1998.

possible but unlikely because RI currently has one of the highest asthma morbidity rates in the country.⁶ (2) A change in the level of exposure to environmental triggers, such as wet and damp housing and school environments, is a potential explanation. However, there is no known information showing that environmental exposure to asthmatic triggers in RI is getting better either absolutely or relative to the US as a whole. (3) Asthma mortality rates may have fallen because of an improvement in the quality of or access to medical care in RI. (4) Improvement in influenza and pneumococcal vaccination rates is a likely hypothesis. Persons with asthma are considered to be at high risk for influenza complications. Over the past ten years, RI and US mortality rates for these illnesses have decreased⁵ and vaccination rates have increased.⁷ In order to investigate this possibility, future studies may wish to collect and analyze data on influenza and pneumococcal vaccination rates among persons with asthma and among decedents whose cause of death is asthma.

Leanne C. Chiaverini is Research Associate, Asthma Control and Cancer Control Programs, Division of Disease Prevention and Control, Rhode Island Department of Health.

Jay S. Buechner, Ph.D., is Chief, Office of Health Statistics, and Assistant Professor of Community Health, Brown University School of Medicine.

References

1. Moorman JE, Mannino DM. Increasing U.S. asthma mortality rates: who is really dying? *Journal of Asthma*. 2001;38:65-71.
2. Mannino DM, Homa DM, Akinbami LJ, et al. Surveillance

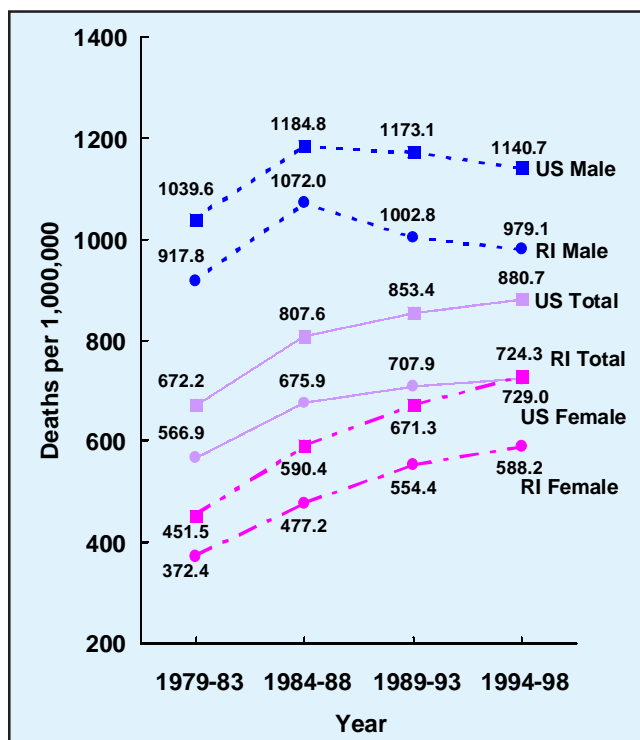


Figure 3. Age-adjusted total respiratory disease mortality rates per 1,000,000 whites, by sex, Rhode Island and United States, 1979-1998.

for Asthma — United States, 1980-1999. *MMWR Surveillance Summaries*. March 29, 2002;51(SS01);1-13.

3. US Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: US Government Printing Office, 2000.
4. Buechner JS. Trends in asthma morbidity and mortality, Rhode Island 1988-1997. *Med & Health/RI* 1999;82:261-262.
5. Centers for Disease Control and Prevention, National Center for Health Statistics. CDC WONDER's Compressed Mortality Files. Available at: <http://wonder.cdc.gov/>
6. Self-reported asthma prevalence among adults - United States, 2000. *MMWR* 2001;50:682-686.
7. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. <http://www.cdc.gov/brfss/index.htm>

Originally published in the October 2002 issue of *Medicine & Health / Rhode Island*

HEALTH

Rhode Island Department of Health
Office of Health Statistics
3 Capitol Hill
Providence, RI 02908

Change service requested
401 222-2550

PRSRT_STD
U.S. Postage
PAID
Providence, R.I. 02904
Permit No. 1286